

# A NEW COMBINATION IN THE *BROMUS CATHARTICUS* COMPLEX (POACEAE: BROMEAE SECT. *CERATOCHLOA*)

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## ABSTRACT

A new combination, *Bromus catharticus* var. *elata* (E. Desv.) Planchuelo is proposed. This taxon has hitherto been treated either as *B. stamineus* E. Desv. or as *B. cebadilla* Steud. Recent morphological evidence supports its recognition as a variety of *B. catharticus*. Detailed illustrations are included along with a morphological description, synonym list, geographical distribution, and representative specimens.

KEY WORDS: *Bromus*, *Ceratochloa*, Poaceae, Bromeae, South and North America

## RESUMEN

Se propone la nueva combinación *Bromus catharticus* var. *elata* (E. Desv.) Planchuelo. Este taxón fue previamente tratado indistintamente como *B. stamineus* E. Desv. o *B. cebadilla* Steud. Evidencias morfológicas recientes validan su ubicación como una variedad de *B. catharticus*. El trabajo se complementa con una detallada ilustración, descripción morfológica, lista de sinónimos, distribución geográfica y especímenes representativos.

During the course of studying materials of *Bromus* deposited in different herbaria, several specimens from AHUC (Holmgren et al. 1990) were sent by the curator for identification. Some of the specimens agree with the morphological features of a native species of *Bromus* from South America which was identified by Cámara Hernández (1978), Matthei (1986), Nicora and Rúgolo de Agrasar (1987), and Zuloaga et al. (1994), as *B. stamineus* E. Desv., and by Gutiérrez and Pensiero (1998), Planchuelo and Peterson (2000), and Pavlick et al. (2003) as *B. cebadilla* Steud. The native area of distribution of this taxon lies primarily in the Southern Andes of the Patagonia region of Argentina and Chile (Gutiérrez & Pensiero 1998). In Chile it grows along the Andes and coastal plains (Matthei 1986), and on Robinson Crusoe Island in the Juan Fernández archipelago (Baeza et al. 2002). In Argentina it grows in western Patagonia (Cámara Hernández 1978) and on the island of Tierra del Fuego (Moore 1983).

This grass was introduced many years ago in Central California for experimental purposes (Hall 1955) and it is now naturalized in North America as reported in Munz and Keck (1959); Wilken and Painter (1993), Kartesz (1994), Pavlick (1995) and Pavlick et al. (2003). Herbarium specimen observations pro-

vide testimony that it is a common garden and orchard weed, growing in disturbed soils in Central and Northern coastal areas of California in the vicinity of San Francisco. Also, there are records of it in northern Oregon and southern Washington (Pavlick 1995). It has also become naturalized in New Zealand (Forde & Edgar 1995), under the names *B. stamineus* and *B. valdivianus*, having been introduced as part of a program of seed sample trials to screen different grasses for their potential forage value.

Phenetic analyses, based on 16 morphological characters, of types and representative specimens of different taxa of sect. *Ceratochloa* (including *B. cebadilla*) (Planchuelo 1991), indicated that *B. cebadilla* and *B. catharticus* should be considered conspecific varieties, as suggested by Peterson and Planchuelo (1998). This variability within this group of grasses has led to the description of numerous taxa at specific and varietal levels based on size, number of nerves, pubescence of the glumes and lemmas, and the length of the lemma awns. Peterson and Planchuelo (1998) clarified the nomenclatural ambiguity of some of the names by accepting the new combination *B. catharticus* var. *rupestris*, leaving the status of other taxa for future investigation. Massa et al. (1997, 2001, 2004)—on the basis of their molecular and morphological studies of 30 germplasm accessions from Patagonia—recommended treating octoploid members of the *B. catharticus* complex as a distinct species, *B. coloratus*, and the hexaploid members as *B. catharticus*. Within *B. catharticus*, they recognized two subspecies, subsp. *catharticus* and subsp. *stamineus*. I compared the morphology and verified the application of the relevant names by examining type materials for members of the *Bromus catharticus* complex. Recognition of *B. stamineus* and *B. cebadilla* at the varietal level seems warranted. At this rank, the epithet *elata*, based on *Bromus unioloides* var. *elata* E. Desv., a taxonomic synonym, has priority. A detailed description, synonyms, representative specimens, geographical distribution and illustrations of *Bromus catharticus* var. *elata* (E. Desv.) Planchuelo are provided below.

***Bromus catharticus* var. *elata*** (E. Desv.) Planchuelo, comb. nov. (**Fig. 1**). BASIONYM:

*Bromus unioloides* var. *elata* E. Desv. in Gay, Fl. Chil. 6:438. 1854. *Bromus unioloides* f. *elatus* (E. Desv.) Allen & Thell. ex Kloos, Ned. Kruidk. Archief 1917:164. 1918. TYPE: CHILE: Santiago, C. Gays.n. (LECTOTYPE designated here: K!; ISOLECTOTYPE: P; photo ACOR!, CONC!, SGO). SYNTYPES in text: CHILE: Santiago, C. Gays.n.; Andes de Santa Rosa, E.F. Poeppig s.n.; Concepción, J.S.C.D. d'Urville s.n.

*Bromus cebadilla* Steud., Syn. Pl. Glumac. 1:321. Apr 1854. TYPE PROTOLOGUE: CHILE: Rancagua, 1828, Bertero 117 (LECTOTYPE designated here?: P, fragm. ex P, BAA !; US-865524!; photo SGO, CONC; ISOLECTOTYPE: MO!). SYNTYPES in text: CHILE: Ins. Juan Fernand., C.G. Bertero 117, 118, 861, 1411 (Bertero 117 also holotype of *Bromus stamineus* E. Desv.).

*Bromus stamineus* E. Desv. in Gay Fl. Chil. 6:440. 1854. *Ceratochloa staminea* (E. Desv.) Stace, Watsonia 18:413. 1991. *Bromus catharticus* subsp. *stamineus* (E. Desv.) Massa, Canad. J. Bot. 82:136–144. 2004. TYPE PROTOLOGUE: CHILE: Rancagua, 1829, C. G. Bertero 117 (HOLOTYPE: P, fragm. ex P, US 865470!; ISOTYPE: MO!; photo, CONC, SGO).

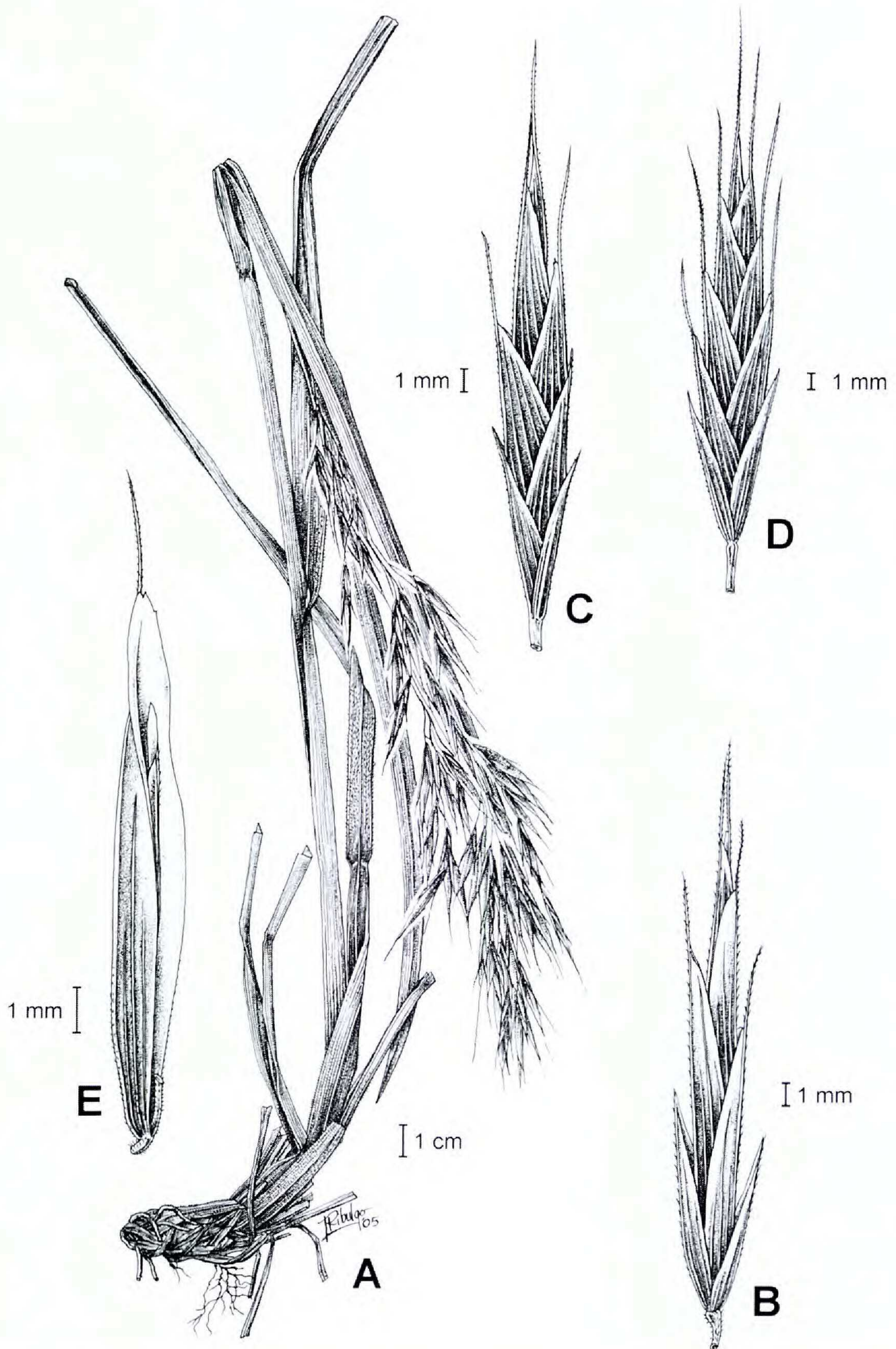


Fig. 1. *Bromus catharticus* var. *elata*. **A**. Habit. **B**, **C**, **D**. Spikelets. **E**. Floret. **A**, **B**, **E**, *Illin 73* (CORD); **C**, *Peñaloza 2220* (AHUC); **D**, *Howell 29056* (AHUC).

*Bromus valdivianus* Phil., *Linnaea* 29:102. 1858. *Ceratochloa valdiviana* (Phil.) Holub., *Folia Geobot. Phytotax.* 8:171. 1973. TYPE: CHILE. Prov. Valdivia: R.A. Philippi s.n. (HOLOTYPE: SGO-PHIL-463).

Usually perennial, occasionally annual, caespitose. Culms 40–100 cm tall, base of the plant with some sheaths from previous seasons. Sheaths glabrous or slightly pubescent open on the upper quarter part. Ligule membranous, glabrous, 2–4 mm long, apex dentate. Auricles absent. Blade 10–30 cm × 4–7 mm, flat, glabrous or slightly pubescent on the upper side. Panicles erect, semi-contracted, 10–20 cm long, with 15–30 or more spikelets, pedicels 2–10 cm long. Spikelets 15–25 mm long, with 4–7-florets, florets imbricate, laterally compressed. Glumes glabrous, the first glume narrowly ovate-lanceolate, 6–8 mm long, 5(–7)-nerved, occasionally only 3 nerves conspicuous, 2 additional nerves evident at the base, the second glume ovate-lanceolate, 7–10 mm long, 7(–9)-nerved. Lemmas ovate-lanceolate, glabrous, usually smooth, occasionally scabrous on all parts, 10–12 mm long, 7–9-nerved, apex bi-denticulate; the awn sub-apical, straight 5–10 mm long. Paleas 10–12 mm long, strongly keeled, with ciliate nerves and adherent to the caryopsis. Anthers 3–4.5 mm long. Caryopsis 7–8 mm long, with a deep, narrow furrow.

*Distribution and habitat.*—Native to South America, *B. catharticus* var. *elata* grows along the Cordillera de Los Andes from Peru to western Patagonia of Argentina and Chile, and on the islands of Tierra del Fuego and Robinson Crusoe. It is adventive in North America where it occurs in Central and Northern coastal areas of California. Pavlick (1995) reported that it also grows in northern Oregon and southern Washington but no records substantiating his report are known (Barkworth, pers comm. 2006). Reported as naturalized in New Zealand (Forde & Edgar 1995). Grows in disturbed soil, waste places.

*Common names.*—In Argentina “cebadilla,” in Chile: “lanco,” “llanco,” “cebadilla,” “pasto del perro” (Matthei 1986) and in USA “Chilean brome” (Pavlick 1995).

Representative specimens studied. **ARGENTINA. Chubut:** Dpto. Cushamen: Cholila, 15 Jan 1901, *Illins* 192 (CORD). **Dpto. Futaleufú:** Lago Futalaufquen, 9 Jan 1948, *Soriano* 2868 (BAA); 3 Feb 1955, *Burkart* 19781 (SI, US); 5 Feb 1955, *Burkart* 19818 (SI, US). **Dpto. Languineo:** Región del río Corcovado, 20 Dec 1901, *Illin* 28 (CORD); 71° W 43° S, 4–6 Mar 1901, *Illin* 73 (CORD). **Neuquén: Dpto. Lacar:** Parque Nacional Nahuel Huapí, Lago Traful, 7 Nov 1949, *Boelcke et al.* 3646 (BAA); San Martín de los Andes, Dec 1938, *Parodi* 13212 (BAA). **Río Negro: Dpto. Bariloche:** Lago Nahuel Huapí, 900 msm, 8 Feb 1934, *Parodi* 11748 (BAA). **Dpto. Bariloche:** Bariloche, *Parodi* 155691/2 (BAA); Cerro Catedral, Dec 1961, *Ellenberg* 1059 (BAA). **CHILE. II Región de Antofagasta:** Antofagasta, Quebrada Cerisso, road to airport S of Antofagasta, 27 Feb 1939. *Beetle* 26188 (MO, US). **III Región de Atacama:** Atacama, 27 Feb 1939. *Beetle* 26188 (MO). **IV Región de Coquimbo:** Dpto. Illapel, Choapa, desvío Pola hasta túnel, 1200–1350 msm, 12 Oct 1945. *Biese* 2128 (LIL). **V Región de Valparaíso:** Valparaíso, An Wegen, 1895, *Buchtien* s.n. (US); Zapallar, 1 Feb 1920, *Holway et al.* 308 (US). **VII Región del Maule:** Maule, *Arroyo* 96089 (CONC. MO). Constitución, Oct 1891 *Philippi* s.n. (US). **VIII Región del Bio Bio: Concepción:** 29 Oct 1919, *Holway et al.* 150 (US); Oct 1925. *Claude-Joseph* 179 (US). **IX Región de la Araucanía:** Cajón, Dec 1942, *Claude-Joseph* 5812 (US); **X Región de los Lagos:** Valdivia, 1888. *Philippi* s.n. (US). **PERU. Junín:** Tarma, 11° 56' S 75° 56' W, 3780 msm, 7 Jan 1983, *Smith* 2980 (MO). **La Libertad:** Trujillo, Cerro Cabezón, 500 msm, 4

Nov 1983, *Sagastegui & Lopez 11005* (MO). **UNITED STATES OF AMERICA: CALIFORNIA: Alameda Co.:** Gill Tract Albany, 5 Jun 1944, *Stebbins Jr. 436-1* (AHUC); Berkeley, 29 Apr 1916, *Smith s.n.*, AHUC 2029 (AHUC); 14 May 1942, *Beetle 3267* (AHUC); 27 May 1942, *Harlan 2745* (AHUC); U.C. Campus, Oxford st. opposite University Ave., 3 Jun 1924, *Buckley 14* (AHUC); in front of Helgard near Oxford, 4 May 1923, *Kennedy s.n.*, AHUC 2027, 2028 (AHUC). **Fresno Co.:** Kings River Canyon near Copper Creek, 5000 ft elevation, 2 Aug 1958, *Howell 34232* (AHUC). **Humboldt Co.:** Fortuna, Fair ground's experimental area, 19 Aug 1947, *Murphy s.n.*, AHUC 26298 (AHUC). **Mendocino Co.:** Van Damme State Park, Mendocino and ca. 1 mi up Little River from Van Damme Beach, along Fern Canyon trail, 14 Jul 1988, *Bowcutt 1099* (AHUC). **Marin Co.:** Tiburon Blvd., 150 yards E of Blackfield Dr., 26 Aug 1961, *Peñalosa 2220* (AHUC). **Napa Co.:** Oakville, Elev. ca. 160 ft, 20 May 1951, *Raven 2836* (AHUC); Calistoga, altitude ca. 300 ft, 5 May 1957, *Raven 10788* (AHUC). **Sacramento Co.:** Brown's Ranch, Elk Grove, 25 Apr 1947, *Cakin s.n.*, DAV 10032 (AHUC). **San Luis Obispo Co.:** Adelaide Road, 4.7 mi W of Paso Robles, 1700 ft, 21 May 1960, *Twisselmann 5970* (AHUC). **San Francisco Co.:** San Francisco, Jackson Street, 2 Jun 1953, *Howell 29056* (AHUC). **Sonoma Co.:** Bluffs above the sea, Sonoma Coast State Park, along State Hwy. 1, 0.9 mi N of Salmon Creek, 11 Jul 1957, *Crampton 4326* (AHUC). **Yolo Co.:** UC Davis agronomy experimental area, plant introduction nursery, May 1950, *Crampton s.n.* AHUC 042728 (AHUC).

Planchuelo and Peterson (2000) recognized eight species in the South American members of sect. *Ceratochloa*. Massa et al. (2004) proposed recognizing only two species, *B. catharticus* and *B. coloratus*, with two subspecies within *B. catharticus*. In this paper, one of the species recognized by Planchuelo and Peterson (2000) as *B. cebadilla* is reduced to a variety. The status of the other species recognized in the mentioned paper merits further study.

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